DOCUMENT RESUME

ED 247 259 TM 840 430

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TITLE Spontaneously Employed Test-Taking Strategies of High and Low Comprehending Elementary School Children.
PUB DATE Apr 84
NOTE 21p.; Paper presented at the Annual Meeting of the American Educational Research Association (68th, New Orleans, LA, April 23-27, 1984).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Confidence Testing; Interviews; *Learning Disabilities; Multiple Choice Tests; Primary Education; *Reading Tests; Testing; *Test Wiseness

ABSTRACT

The present investigation was intended to provide information on the type of strategies employed by learning disabled (LD) students on standardized, group-administered achievement test items. Of particular interest was level of strategy effectiveness and possible differences in strategy use between LD and non-disabled students. Students attending resource rooms and regular third grade classes were administered items from reading achievement tests and interviewed individually concerning the strategies each had employed in answering the questions and level of confidence in each answer. Results indicated that (1) LD students were less likely to report use of appropriate strategies on inferential questions, (2) LD students were less likely to attend carefully to specific format demands, and (3) levels of confidence reported by LD students were inappropriately high. (Author)

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Spontaneously Employed Test-Taking Strategies of High and Low Comprehending Elementary School Children

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Running head: TEST-TAKING SKILLS

Abstract

The present investigation was intended to provide information on the type of strategies employed by learning disabled (LD) students on standardized, group-administered achievement test items. Of particular interest was level of strategy effectiveness and possible differences in strategy use between LD and non-disabled students. Students attending resource rooms and regular third grade classes were administered items from reading achievement tests and interviewed individually concerning the strategies each had employed in answering the questions and level of confidence in each answer. Results indicated that (a) LD students were less likely to report use of appropriate strategies on inferential questions, (b) LD students were less likely to attend carefully to specific format demands, and (c) levels of confidence reported by LD students were inappropriately high.

Spontaneously Employed Test-Taking Skills of Learning Disabled Students on Reading Achievement Tests

Since the seminal work of Millman, Bishop, and Ebel in 1965, concern has been given to the issue of test-taking skills, or "test-wiseness," as a source of measurement error in group-administered achievement tests (Sarnacki, 1979). Defined as "a subject's capacity to utilize the characteristics and formats of the test and/or the test-taking situation to receive a high score" (Millman et al., 1965, p. 707), test-wiseness is said to include such diverse components as guessing, time-using, and deductive reasoning strategies. Given that the effective use of such strategies may have little to do with knowledge of a particular academic content area, individuals or groups of individuals lacking in these skills may be at a disadvantage. A recently completed meta-analysis, for example, has suggested that under certain circumstances, low-SES students are more likely to benefit from achievement test "coaching" than are higher SES students, which finding implies low-SES students are relatively deficient in the area of test-taking skills (Scruggs, Bennion, & White, 1984).

The present investigation was concerned with the spontaneous use of such strategies by learning disabled (LD) children. Part of a larger investigation involving test-taking skills of

exceptional students (Taylor & Scruggs, 1983), the present study had as a goal the identification of possible deficits in test-taking skills on the part of LD children. Such deficits, if uncovered, could be helpful in developing techniques for remediation.

Although much research has been conducted on non-handicapped populations in the area of test-taking skills (see Bangert-Drowns, Kulik, & Kulik, 1983; Sarnacki, 1979; and Scruggs, Bennion, & White, 1984, for reviews), little is known about test-taking skills exhibited by LD children. Scruggs and Lifson (1984) recently investigated the differential ability of LD students to answer "passage independent" reading comprehension test items (i.e., reading comprehension test items for which relevant passages had been omitted). Items were taken from standardized achievement tests known from previous research to be answerable without having read the associated passage (Lifson & Scruggs, in press), and thought to be a good measure of "test-wiseness." In two experiments, non-handicapped children scored 55% and 65% correct on such items, while LD children from the same grade scored much lower, even when word reading ability was controlled. Scruggs and Lifson (1984) argued that such findings also raised the question of what reading comprehension tests "really" measure since no reading comprehension test items should be answerable without having read the associated passage. Scruggs and Lifson concluded that LD children may be at a relative disadvantage with

respect to such test-taking skills as guessing, elimination, and deductive reasoning strategies applied to response items.

Scruggs, Lifson, and Bennion (in press) recently employed individual interview techniques to more precisely determine the nature of the strategies spontaneously produced by elementary school children on reading achievement tests. Students representing a wide range of age and ability levels were given reading achievement test items appropriate to each student's reading level. Results indicated that students employed a wide range of strategies on reading achievement tests, far beyond simply "knowing" or "not knowing" the answer, and that the use of these strategies was strongly predictive of performance. These findings provided valuable general information regarding the manner in which children respond to reading achievement test items. However, the diversity of the population in age and achievement level was thought to have obscured observation of specific differences in test-taking skills between age or ability levels. The present investigation, therefore, was intended to determine whether differences in strategy use existed on reading achievement tests between LD and non-disabled students. In this investigation, grade level was held constant and the number of subtests was reduced to two: a "reading comprehension" subtest, in which direct referring, elimination, and deductive reasoning

strategies were thought to be important; and a "letter sounds" subtest, in which close attention to format demands was thought to be of importance. In addition, since level of reported confidence was found to be a strong predictor of performance (Scruggs, Bennion, & Lifson, in press), and a prerequisite to strategy monitoring, confidence reports were examined for possible differences between ability groups.

Method

Subjects

Subjects were 32 third grade students attending public schools in a western university community. Twelve were classified as learning disabled (LD) according to local school district criteria, which included a 40% discrepancy between ability and performance in two academic areas, and Public Law 94-142. Twenty were regular classroom students, none of whom were referred for special services and who were thought by their teachers to be functioning within a normal range of performance. Mean grade equivalent for reading comprehension on the Comprehensive Test of Basic Skills (CTBS) was 2.29 (SD=.29), equivalent to a percentile score of approximately 21. Mean grade equivalent on the CTBS for the non-LD students was 3.91 (SD=.89), equivalent to a percentile score of 61. The 16 boys and 16 girls were all 8-9 years old and Caucasian. Sex was evenly represented in LD and non-LD groups.

Materials

Two reading tests were constructed from items taken from the

Stanford Achievement Test. Items were drawn from the Primary 2 battery for the instrument used with the LD group, and the Intermediate 1 level served as the source for the regular classroom group. Each test contained three reading passages with 14 dependent questions (10 content, 4 inference) on each form. Comprehension questions were left in their original order in relation to the passage. The questions were renumbered to avoid gaps where passages did not follow each other sequentially in the original test. In addition, three items from the letter-sound test (level P3) were selected. These consisted of a stimulus word with a letter or letters underlined representing a sound that the student was to identify in the three options given below the stimulus word. These items were selected to include a distractor that closely matched the initial consonants of the stimulus word. For example, in the item:

bli<u>nd</u>

O blink

O nibble

O leaned

"leaned" is the correct answer, since it contains the same sound as the underlined <u>nd</u> in the stem, and "blink" is the inappropriate distractor, since it contains the same initial consonant blend.

<u>Procedure</u>

Subjects were seen individually by one of two examiners.

They were asked to read the passages and questions aloud and mark answers they thought were correct. They were then told that they would be asked if they were sure/not sure that the answer they had given was correct, and the manner in which they had chosen the particular answer. The subject's response to the questions, "How did you choose that answer?" and "Are you sure or not sure of your answer?" were recorded verbatim on the protocol. Words the experimenters had previously deemed essential to answering the questions (key words) were marked in the examiner's copy of the instrument, and errors in these words were noted as the child read aloud.

Scoring

Test items were scored for correctness, confidence in answer (sure/not sure), and type of strategy reported. Two students from the non-LD group, who had misread more than 25% of the keywords, were excluded from further analysis. The responses given by the subjects were divided into seven logical categories:

1 = Don't know

2 = Guessed

3 = External source of knowledge (e.g., "I know all fish have scales")

4 = Refers to passage (e.g., "I read it")

5 = Quotes directly (e.g., "It says here that . . .")

6 = Eliminates options known to be incorrect

7 = Other reasoning (e.g., "It said comforted in the story. That sort of means relieved.")

Each response was then evaluated in terms of those seven categories. Percent of agreement for scoring was assessed at 100% after each examiner scored 25% of the other examiner's protocols.

Results

A *t* test applied to percent of keywords read incorrectly indicated that the groups did not differ significantly with respect to reading difficulty, $t(29) = .37$, $p > .20$. Overall, LD students misread 6.6% of (30) total keywords and non-LD students misread 6.75% of (29) keywords.

Proportion correct by collapsed strategy group (inappropriate = strategies 1-3; referring = strategies 4-5; reasoning = strategies 6-7) was computed for item type and student group and is given in Figures 1 and 2.

Insert Figures 1 and 2 about here

Reported strategy data were scored for appropriateness of reported strategy. Strategies were considered appropriate if students reported referring to the passage on a recall question (strategy 4 or 5), or if they reported a reasoning strategy in response to an inferential question (strategy 6 or 7). Proportion of appropriate responses were then entered into a 2 group (LD vs.

non-LD) by 2 item type (direct recall or inferential) analysis of variance (ANOVA) with repeated measures on the item type variable. Because of the unequal group frequencies, a least-squares method of analysis (Winer, 1971) was employed. Significant differences were found for item type, $F(1,29) = 9.19$, $p < .01$, and for interaction, $F(1,27) = 7.58$, $p < .05$. Figure 3 depicts graphically the interaction effect. Although both LD and non-LD

Insert Figure 3 about here

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students reported a high proportion of "referring to text" strategies on recall questions (89% vs. 77%, respectively), large differences emerged in proportion of reasoning strategies applied to inferential questions (39% vs. 70%, respectively). Nonsignificant differences were observed for overall group means, $F(1,29) = 1.54$, ns.

Analysis of confidence reports indicated that both groups were similar with respect to reported level of confidence on "referring to passage" strategies with LD students reporting confidence in 85% of the cases and non-LD students reporting confidence in 92% of the cases. These reports were similar to actual performance, with correct scores of 81% and 86% on these items for LD and non-LD groups, respectively. On reasoning strategies, however, a much different picture emerged. Average

students were correct on 83% of inferential items, but reported confidence on an average of 71% of the items. The LD students, on the other hand, reported being confident on an average of 95% of the cases, but were in fact correct in only 63% of these cases.

Items on the letter-sound subtest were scored for responses which suggested attention to an inappropriate distractor. This inappropriate distractor took the form of an initial consonant blend present in the ster but not underlined. Number of inappropriate distracto . chosen was compared by group, and differences found to be significant, $t(23) = 2.47$, $p < .05$. The LD children chose the inappropriate distractor in 52% of the cases, while the non-LD children chose the inappropriate distractor in only 24% of the cases.

Discussion

It has been seen that the present sample of LD third graders, with reading ability controlled for, differed from their more average counterparts with respect to (a) proportion of appropriate reasoning strategies reported for inferential comprehension questions, (b) performance and confidence level for items in which reasoning strategies had been reported, and (c) choice of an inappropriate distractor on a letter-sounds test. On the other hand, LD students did not differ from their more average counterparts with respect to appropriate strategy use on recall items. Generally, this sample of LD children was seen to report

fewer reasoning strategies, when appropriate, on reading comprehension test items than did their more average counterparts, and to be less successful on those items for which they did report reasoning strategies. These findings support those reported by Scruggs and Lifson (1984). In that study, LD children were seen to exhibit relatively inferior performance on a test of selected reading comprehension test items for which the relevant passages had been removed, and for which reasoning strategies were thought to be necessary in order to answer the items correctly. The present finding of inappropriately high levels of confidence exhibited by the LD students on items for which reasoning strategies had been applied is supportive of a theory of a developmental deficit in "meta-cognitive abilities" (cf. Torgesen, 1977), in that inappropriately high levels of confidence in task performance are often seen in younger children. This relative deficit on the part of LD children is thought to be a critical one, for ability to evaluate accurately a chosen response is a necessary prerequisite for effective test-taking performance.

That LD students more often attended to an inappropriate distractor may be a function of an attentional deficit (Krupski, 1980) on test format as much as a deficit in phonetic skills. These "test-taking skills" may or may not be subject to simple remediation (Taylor & Scruggs, 1983), but they may reflect a source of measurement error (Millman, Bishop, & Ebel, 1965).

Reading comprehension, clearly, is a construct which seems to resist precise analysis and for which many theoretical orientations exist (Spiro, Bruce, & Brewer, 1980). If one does look at recall and inference as two component parts of reading comprehension, however, it appears from the present investigation that relative strategy and performance deficits exist on the part of LD children on inference questions, but not on recall questions, with reading ability controlled for. To this extent, one could argue that the specific deficits exhibited here reflect problems in reading comprehension itself rather than "test-taking skills," and it does seem likely that strategy training in such areas could reflect improved reading comprehension skills as well as improved test-taking skills, particularly in that selecting and implementing appropriate strategies has been used in research to improve general cognitive functioning (cf. Torgesen & Kail, 1980). In the word study skills subtest, however, the LD students apparently became confused by specific format demands which likely had little to do with the content being tested. Training for this type of strategy deficit, then, would not be expected to bring about a concomitant increase in phonetic analysis skills.

Replication is necessary to further support and refine these findings. The present results suggest that LD children may benefit from specific training in (a) attending to specific format demands, (b) identifying inference questions, and (c) selecting and applying appropriate strategies relevant to those questions.

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Footnote

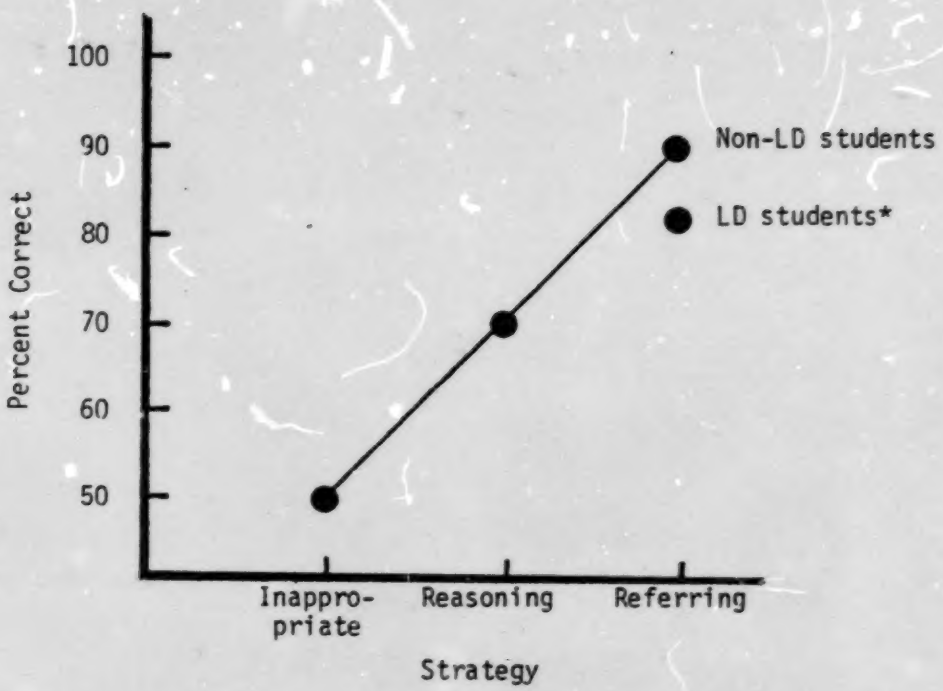
[1]The authors would like to thank Mrs. Bonnie Olsen, as well as Dr. Ted Williams, director, and the staff of the Edith Bowen School, particularly Dorothy Dobson, for their valuable assistance with this project. The authors would also like to thank Marilyn Tinnakul and Jill Barry for typing the manuscript. Address requests for reprints to Thomas E. Scruggs, Ph.D., UMC 68, Utah State University, Logan, Utah 84322.

Figure Captions

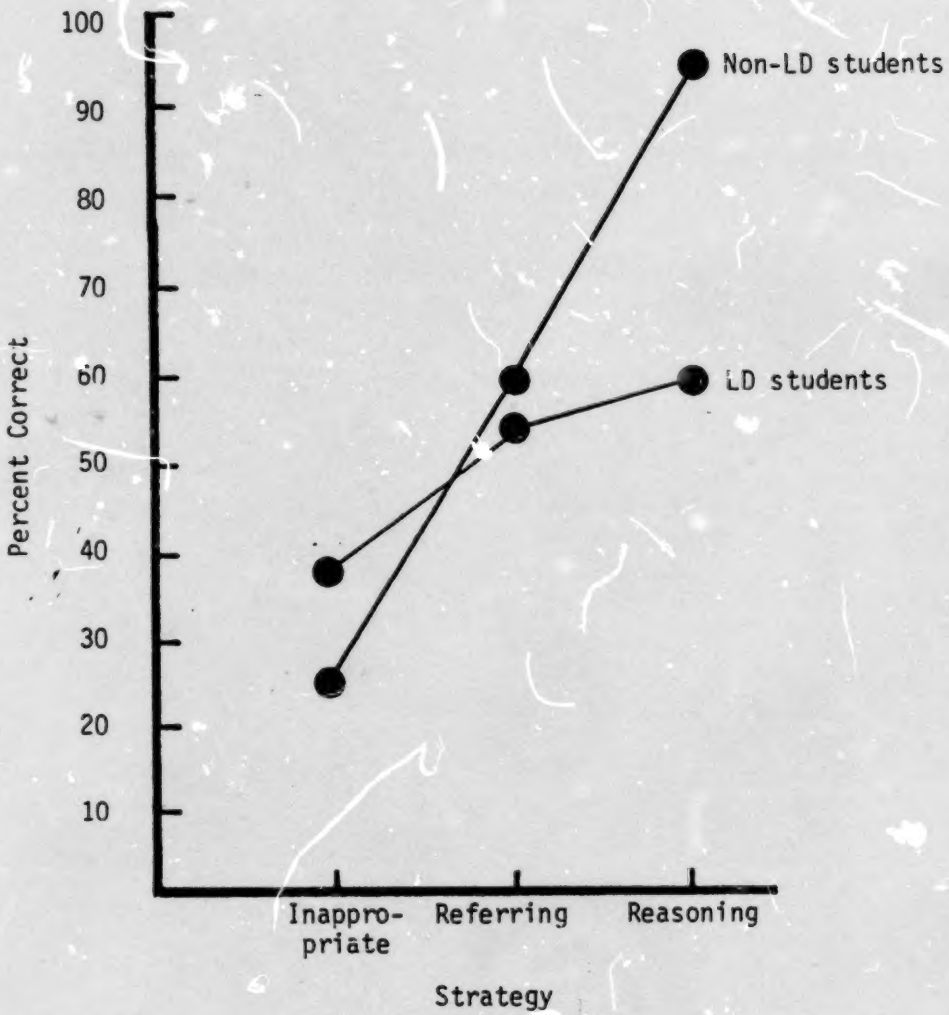
Figure 1. Proportion correct by strategy used on recall item.

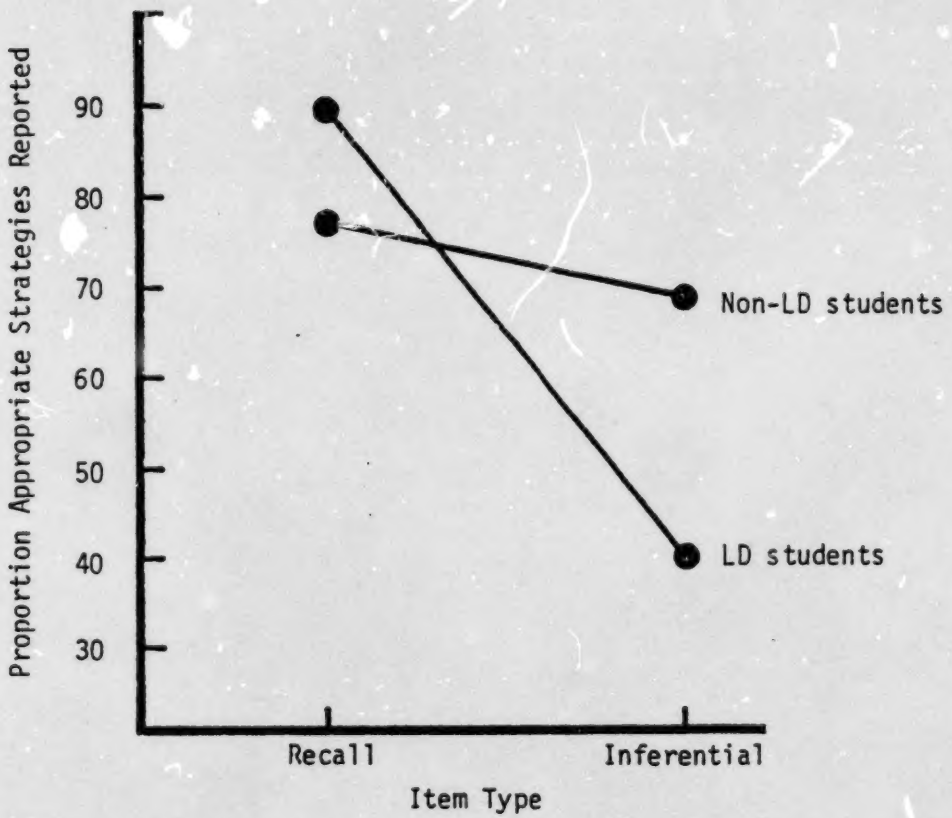
Figure 2. Proportion correct by strategy used on inferential items.

Figure 3. Illustration of two-way interaction of group by reported use of appropriate strategy.



*Fewer than 25% of students in this group reported Inappropriate or Reasoning strategies.


100
90
80
70
60
50
40
30
20
10
Percent Correct
Non-LD students
LD students
Inappro-
priate
Referring
Reasoning
Strategy


Proportion Appropriate Strategies Reported
90
80
70
60
50
40
30
Non-LD students
LD students
Recall
Inferential
Item Type